Patent claims

I claim:

1. A tamping machine for soil compaction, comprising:

a rotatable drive shaft connected to a motor;

a working mass linearly reciprocatable in a tamping direction to tamp soil; and

a crank mechanism and a spring assembly configured to translate rotational movement of the drive shaft into the linear movement of the working mass, the crank mechanism including:

a crank disc operatively connected to the drive shaft for rotational movement therewith;

a connecting rod fabricated from an elastic material having a density lower than the density of steel, the connecting rod having an upper end operatively connected to the crank disc and a lower end;

a guide pin having an upper end pivotably connected to the second end of the connecting rod and a lower end; and

a piston guide threaded onto the lower end of the guide pin.

2. The tamping machine of claim 1, wherein the connecting rod includes an O-shaped leg defining a passageway through the connecting rod.

3. The tamping machine of claim 2, wherein the drive shaft passes through the passageway in the connecting rod.

4. The tamping machine of claim 1, wherein the elastic material is selected from the group consisting of: carbon fiber-reinforced polyamide and carbon glass fiber-reinforced polyamide.

5. The tamping machine of claim 1, wherein the piston guide includes:

a central portion having first and second sides;

an upper expansion sleeve projecting from the first side of the central portion, the upper expansion sleeve receiving a portion of the guide pin therein; and

a lower expansion sleeve extending from the second side of the central portion.

6. The tamping machine of claim 5, wherein the central portion, the upper expansion sleeve and the lower expansion sleeve of the piston guide are integrally fabricated from polyurethane.

7. The tamping machine of claim 5, wherein the upper expansion sleeve of the guide piston includes an inner surface, the inner surface having a trapezoidal thread for connecting the piston guide to the guide pin.

8. A tamping machine for soil compaction, comprising: an upper mass including a motor, a working mass that is driven in a tamping manner and that can be driven linearly back-and-forth, via a crank mechanism and a spring assembly, by the motor belonging to an upper mass, wherein the crank mechanism has at least one structural element that is movable linearly back and forth and that is produced from a material, the density of which is lower than that of steel, and wherein said crank mechanism comprises a connecting rod produced from said material.

9. The tamping machine of claim 8, wherein said at least one structural element is nonelastically connected to said connecting rod.

10. The tamping machine of claim 8, wherein said at least one structural element comprises a substantially cylindrical guide piston.

11. The tamping machine of claim 8, wherein said at least one structural element comprises a substantially tubular piston guide.

12. The tamping machine of claim 8, wherein said connecting rod is O-shaped.

13. The tamping machine of claim 8, wherein said material is chosen from the group consisting of an aluminum alloy, a carbon-fiber reinforced polyamide, a glass-fiber reinforced polymide and plastics, including polyurethanes.

14. The tamping machine of claim 8, wherein said at least one structural element comprises a piston guide produced from plastic in one piece together with at least one dampening bushing.

15. A tamping machine for soil compaction, comprising: an upper mass including a motor, a working mass that is driven in a tamping manner and that can be driven linearly back-and-forth, via a spring assembly and a crank mechanism comprising a connecting rod, by the motor, wherein the crank mechanism has at least one structural element that is movable linearly back and forth and that is produced from a material, the density of which is lower than that of steel, and wherein said at least one structural element comprises a substantially cylindrical guide piston that is nonelastically connected to said connecting rod.

16. The tamping machine of claim 15, wherein said connecting rod is produced from said material.

17. The tamping machine of claim 15, wherein said at least one structural element comprises a substantially tubular piston guide.

18. The tamping machine of claim 15, wherein said connecting rod is O-shaped.

19. The tamping machine of claim 15, wherein said material is chosen from the group consisting of an aluminum alloy, a carbon-fiber reinforced polyamide, a glass-fiber reinforced polyimide, and plastics, including polyurethanes.

20. The tamping machine of claim 15, wherein said at least one structural element comprises a piston guide produced from plastic in one piece together with at least one dampening bushing.